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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,987	03/08/2002	Hajime Seki	302-001	7219

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EXAMINER

COLEMAN, ERIC

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,987

Applicant(s)

SEKI, HAJIME

Examiner

Eric Coleman

Art Unit

2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alsup (patent No. 5,694,564) in view of Meyer (patent No. 6,442,677).

Alsup taught the invention as claimed including a data processing ("DP") system comprising:

- a) Physical registers (20) (e.g., see fig. 2,3,4) the number greater than that of the logical registers prescribed by the architecture (e.g., see col. 4, line 31-col. 5, line 3);
- b) Free list (32) that is designed to hold unallocated physical-register numbers (e.g., see fig. 2 and col. 4, lines 10-57 and col. 5, line 4-col. 6, line 44);
- c) Mapping table (30) having entries that are provided in respective correspondence with the logical registers and each designated to hold a physical-register number (e.g., see col. 4, line 31-col. 6, line 9);
- d) For a group of instructions that are to go through the process of register renaming marking each logical-register number shown as a destination operand with a tag that corresponds to the order of the instructions (e.g., see col. 6, line 44-col. 7, line 65);

e) Each logical register number on which a tag is marked is renamed to the physical register number that is to be taken out of the free list and allocated in correspondence with the marked tag (e.g., see figs. 4,5,6,7,8,9, and col. 8, lines 3-67); and

f) Each logical register number on which no tag is marked is renamed to the physical register number to be obtained by accessing the mapping table (e.g., see col. 9, lines 7-37).

Alsup did not expressly detail (claim 1) marking each logical-register number shown as a source operand that is read-after-write dependent on an instruction that goes through the process of register renaming simultaneously with the same tag that is being marked on the destination operand of the instruction. Meyer however taught when a source operand of a subsequent instruction corresponds to the destination operand of the load instruction if the tag is assigned to the source operand is the same as the destination register tag (e.g., see col. 15, line 62-col. 16, line 6).

It would have been obvious to one of ordinary skill in the DP art to combine the teachings of Alsup and Meyer. One of ordinary skill in the DP art would have been motivated add the Meyer teachings of assigning the same tag to a two instruction where the source of one instruction is read after write dependent on the load instruction at least in order to take advantage of the Meyer teachings of superforwarding the operands to more efficiently provide operands for processing (e.g., see col. 16, lines 50-65 of Meyer).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Alsup (patent No. 5,694,564).

Alsup taught the invention as claimed including a data processing ("DP") system comprising: a free list comprising F registers to the number of instruction that can go through the process of register renaming in a clock cycle, (e.g., see fig. 2,3,4,5,6,7,8,9) which is designed to hold a physical-register number (e.g., col. 5, lines 4-66); and a circular FIFO queue that is made of a register file each entry of which is designed to hold a physical-register number (e.g., see col. 10, lines 20-55) wherein the physical-register numbers that are being released from allocation are to be entered into the queue; and physical-register numbers are to be supplemented from the head of the queue of F registers out of which physical-registers out of which physical register numbers are being taken (e.g., see col. 10 , lines 20-55).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shen (patent No. 5,751,985) disclosed a processor structure for tracking instruction status and maintain precise state (e.g., abstract).

Tovey (patent No. 5,740,414) disclosed a system for coordinating the use of physical registers in a microprocessor (e.g., see abstract).

Cocke (patent (No. 4,992,938) disclosed a instruction control mechanism for a computing system with register renaming map table, and queues indicating available registers (e.g., see abstract).


Thayer (patent No. (5,893,145) disclosed a system that routes source and destination operand for the same slot (e.g., see col. 24, lines 39-66).

Widigen (patent No. 5,919,256) disclosed a system that tagged operands and speculative executed instructions (e.g., see abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Coleman whose telephone number is (571) 272-4163. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


ERIC COLEMAN
PRIMARY EXAMINER